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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/808,336	03/25/2004	Nobuo Higaki	59349.00016	5455

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EXAMINER	
OLSEN, LIN B	

ART UNIT	PAPER NUMBER
3609	

MAIL DATE	DELIVERY MODE
08/29/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/808,336	HIGAKI ET AL.	
	Examiner	Art Unit	
	Lin B. Olsen	3609	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *3/25/2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-10* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-10* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *25 March 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *6/23/2004*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Priority

Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Information Disclosure Statement

The listing of references in the specification is not a proper information disclosure statement. 37 CFR 1.98(b) requires a list of all patents, publications, or other information submitted for consideration by the Office, and MPEP § 609.04(a) states, "the list may not be incorporated into the specification but must be submitted in a separate paper." Therefore, unless the references have been cited by the examiner on form PTO-892, they have not been considered.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1- 10 are rejected under 35 U.S.C. 102(b) as being anticipated by "Using Stereo Vision to pursue Moving Agents with a Mobile Robot," Eric Huber and David Kortenkamp, IEEE International Conference on Robotics.and Automation, 1995, Pgs 2340-2346 (hereafter referred to as Huber).

The recitation of a "biped robot having a body and two legs each connected to the body" in claims 1 and 6 has not been given patentable weight because the recitation

occurs in the preamble. A preamble is generally not accorded any patentable weight where it merely recites the purpose of a process or the intended use of a structure, and where the body of the claim does not depend on the preamble for completeness but, instead, the structural limitations are able to stand alone. See *In re Hirao*, 535 F.2d 67, 190 USPQ 15 (CCPA 1976) and *Kropa v. Robie*, 187 F.2d 150, 152, 88 USPQ 478, 481 (CCPA 1951).

Huber teaches a moving robot with cameras for capturing stereoscopic images; processor for analyzing images, detecting moving objects, calculating the position of the moving object(s) relative to the robot and stopping the robot based on predetermined criteria.

Regarding **claim 1**,

- "a plurality of cameras mounted on the robot and capturing a stereoscopic image around the robot" reads on Huber, page 2340, the first ¶ under "2 The stereo vision system" – two black and white CCD cameras mounted on a pan-tilt-verge head which is mounted on the robot. The mounting of the cameras allows them to be turned to take images around the robot. "captured image analyzer inputting and analyzing the image captured by the cameras," reads on Huber, page 2341, 3rd ¶ in section 2.2.1, where analysis of the image to determine areas of common surface material is described.
- "moving object detector detecting presence of a moving object around the robot based on the analyzed image" reads on Huber page 2342, 1st ¶

under section 2.3, where acquiring, tracking and re-acquiring moving agents is a task performed.

- "calculating a position and an angle of the moving object relative to the robot," reads on Huber, page 2344, bullet 1, under section 3, where the vision task acquires and tracks the agent, outputting the (x,y,z) position of the object relative to the robot.
- "stop motion determinator determining whether a motion of the robot needs to be stopped based on the detected position and angle of the moving object relative to the robot" reads on Huber page 2345 1st ¶ under 3.1 where TRACK-AGENT calculates the speed and distance for the robot to travel, including zero speed if the robot is close enough to the target. Later in the ¶, Huber details how the robot speed is set to zero whenever the target is lost.
- "robot motion controller controlling the robot to stop the motion when the motion of the robot is determined to be stopped" reads on Huber, 1st ¶ under 3.2 where even if the target stops moving, the robot maintains a fixed distance – which shows that robot stops after the TRACK-AGENT determines that it should stop.
- "such that a distance of travel of the robot from the capture of image to the stopping of motion of the robot falls within a predetermined distance." reads on an inherent property of Huber that is logically implied. As detailed on Page 2344, point 2 in section 3 "Integration into a mobile

robot", the TRACK-AGENT generates goal positions and velocities for the robot based on the location, distance and speed of the agent being pursued. On page 2345, 1st ¶ under 3.1 "Executing the pursuing task", the desired speed may be zero if the robot is close enough to the agent or even negative if the agent is too close. In fact in the 1st ¶ of 3.2, the robot maintains a fixed distance (2 meters) from the agent when the agent is stopped because two meters is the predetermined minimum distance that the robot maintains between itself and the agent. In order to accomplish these behaviors, the robot must be being controlled such that, considering the speed of the robot and of the moving agent, it is still stopping within a predetermined distance. Therefore, it is inherent that Huber's methodology stops a robot within a predetermined distance from the time an image is taken of the agent.

Regarding **claim 2**, which is dependent on claim 1, "the robot motion controller controls the robot to stop the motion if the motion of the robot is determined to be stopped when the robot moves at its maximum speed, such that the distance of travel of the robot from the capture of image to the stopping of motion of the robot falls within the predetermined distance". This implementation of the stopping algorithm falls within the inherent interpretation of Huber's method as detailed in the explanation for claim 1.

Regarding **claim 3**, which depends on claim 1, "wherein the moving object detector calculates a speed of the moving object relative to the robot," reads on Huber page 2345, 1st ¶ of section 3.1 where the TRACK-AGENT skill, calculates the distance

and speed of the object and chooses a desired speed for the robot. "the robot motion controller controls the robot to stop the motion such that the distance of travel of the robot falls within the predetermined distance, when the detected speed of the moving object relative to the robot is a predetermined value" falls within the inherent interpretation of Huber's method as detailed in the explanation for claim 1.

Regarding **claim 4**, which depends on claim 3, "wherein the predetermined speed is a speed determined when the robot moves at its maximum speed", falls within the inherent interpretation of Huber's method as detailed in the explanation for claim 1

Regarding **claim 5**, which depends on claim 1, "wherein the moving object is a human being," reads on Huber page 2342, 1st ¶ under 2.3 where a moving agent is identified as either a person or another robot. Further on page 2343, 1st ¶ in the second column, Huber claims that it can track objects of significantly disparate scales, such as softballs and humans.

Regarding independent **claim 6,** this claim is a method claim implementing a method of controlling a robot as described in claim 1. Claim 6 is rejected for the same reasons as claim 1.

Regarding **claim 7**, which depends on claim 6, this a method version of claim 2 and is rejected for the same reasons.

Regarding **claim 8**, which depends on claim 6, this a method version of claim 3 and is rejected for the same reasons.

Regarding **claim 9**, which depends claim 8, this a method version of claim 4 and is rejected for the same reasons.

Regarding **claim 10**, which depends on claim 6, this a method version of claim 5 and is rejected for the same reasons.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. U.S. Patent Nos. 5,378,969, 7,120,518 and 7,191,036 that are the US patent equivalents of the cited Japanese patents. Murray & Little, "Using Stereo Vision for Mobile Robot Navigation" for stereo image capture and analysis; Koyasu, Miura & Shirai, "Recognizing Moving Obstacles for Robot Navigation using Real-time Omnidirectional Stereo Vision" for determining the position of a target; Park & Lee, "Fast Distance Computation with a Stereo Head-Eye System" for image processing; Fujita, Kuroki, Ishida & Doi, "A Small Humanoid Robot SDR-4X for Entertainment Applications" for interacting with humans; and Cheng & `Zelinsky, "Real-Time Visual Behaviours for Navigating a Mobile Robot" for target finding.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Lin B. Olsen whose telephone number is 571-272-9754. The examiner can normally be reached on M-Th 7:30 – 5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Brian T. Pendleton can be reached on 571-272-7527. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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BRIAN TYRONE PENDLETON
SUPERVISORY PATENT EXAMINER